

1 What is claimed is:

2
3 1. A method of estimating a quantity of media sheets remaining in a stack thereof,
4 the method comprising:

5 obtaining a first quantitative measurement of the stack;

6 dispensing at least one media sheet from the stack;

7 obtaining a second quantitative measurement of the stack;

8 establishing a difference by subtracting the second quantitative measurement
9 from the first quantitative measurement;

10 establishing a count by counting the media sheets that are dispensed from the
11 stack between the first quantitative measurement and the second quantitative
12 measurement;

13 establishing a ratio by dividing the count by the difference; and,

14 establishing an estimated quantity of media sheets remaining in the stack by
15 multiplying the second quantitative measurement by the ratio.

16
17 2. The method of claim 1, and further comprising determining that the estimated
18 quantity of media sheets remaining in the stack is low in response to establishing the
19 estimated quantity of media sheets remaining in the stack.

20
21 3. The method of claim 2, and further comprising transmitting an "add media" signal
22 in response to determining that the estimated quantity of media sheets remaining in the
23 stack is low.

24
25 4. The method of claim 1, and further comprising:

26 obtaining a third quantitative measurement of the stack; and,

27 establishing an estimated quantity of media sheets remaining in the stack by
28 multiplying the third quantitative measurement by the ratio.

29
30 5. The method of claim 1, and wherein obtaining the first quantitative measurement
31 of the stack and obtaining the second quantitative measurement of the stack each
32 comprise determining a respective weight of the stack.

1 6. The method of claim 1, and wherein obtaining the first quantitative measurement
2 of the stack and obtaining the second quantitative measurement of the stack each
3 comprise determining a respective thickness of the stack.
4

5 7. The method of claim 1, and further comprising:
6 obtaining a third quantitative measurement of the stack;
7 establishing an updated difference by subtracting the third quantitative
8 measurement from the first quantitative measurement;
9 establishing an updated count by counting the media sheets that are dispensed
10 from the stack between the first quantitative measurement and the third quantitative
11 measurement;
12 establishing an updated ratio by dividing the updated count by the updated
13 difference; and,
14 establishing an updated estimated quantity of media sheets remaining in the
15 stack by multiplying the third quantitative measurement by the updated ratio.
16

17 8. The method of claim 1, and further comprising:
18 obtaining a third quantitative measurement of the stack;
19 establishing an updated difference by subtracting the third quantitative
20 measurement from the second quantitative measurement;
21 establishing an updated count by counting the media sheets that are dispensed
22 from the stack between the second quantitative measurement and the third quantitative
23 measurement;
24 establishing an updated ratio by dividing the updated count by the updated
25 difference; and,
26 establishing an updated estimated quantity of media sheets remaining in the
27 stack by multiplying the third quantitative measurement by the updated ratio.
28

29 9. The method of claim 1, and further comprising:
30 providing a proposed print job; and,
31 evaluating whether the estimated quantity of media sheets remaining in the stack
32 is sufficient to complete the proposed print job.
33
34

1 10: The method of claim 9, and further comprising:
2 determining that the estimated quantity of media sheets remaining in the stack is
3 not sufficient to complete the proposed print job; and,
4 transmitting an "add media" signal in response to determining that the estimated
5 quantity of media sheets remaining in the stack is not sufficient to complete the
6 proposed print job.
7

8 11. The method of claim 1, and further comprising:
9 providing a first proposed print job and a second proposed print job;
10 determining whether the estimated quantity of media sheets remaining in the
11 stack is sufficient to complete the first proposed print job;
12 determining that the estimated quantity of media sheets remaining in the stack is
13 not sufficient to complete the first proposed print job; and,
14 determining whether the estimated quantity of media sheets remaining in the
15 stack is sufficient to complete the second proposed print job in response to determining
16 that the estimated quantity of media sheets remaining in the stack is not sufficient to
17 complete the first proposed print job.
18

19 12. The method of claim 11, and further comprising:
20 determining that the estimated quantity of media sheets remaining in the stack is
21 sufficient to complete the second proposed print job; and,
22 printing the second proposed print job in response to determining that the
23 estimated quantity of media sheets remaining in the stack is sufficient to complete the
24 second proposed print job.
25
26

1 13. A method of estimating a quantity of media sheets remaining in a stack thereof,
2 the method comprising:

3 • dispensing a number of media sheets from the stack, wherein the number of
4 media sheets comprises at least a first sheet and a last sheet;

5 determining an initial thickness of the stack before the first sheet is dispensed
6 therefrom;

7 determining a final thickness of the stack after the last sheet is dispensed
8 therefrom;

9 determining a difference between the initial thickness and the final thickness;

10 establishing a ratio that is equal to the number of media sheets dispensed from
11 the stack divided by the difference between the initial thickness and the final thickness;
12 and,

13 establishing an estimated quantity of media sheets remaining in the stack by
14 multiplying the ratio by the final thickness of the stack.

15
16 14. A method of estimating a quantity of media sheets remaining in a stack thereof,
17 the method comprising:

18 dispensing a number of media sheets from the stack, wherein the number of
19 media sheets comprises at least a first sheet and a last sheet;

20 determining an initial weight of the stack before the first sheet is dispensed
21 therefrom;

22 determining a final weight of the stack after the last sheet is dispensed therefrom;

23 determining a difference between the initial weight and the final weight;

24 establishing a ratio that is equal to the number of media sheets dispensed from
25 the stack divided by the difference between the initial weight and the final weight; and,

26 establishing an estimated quantity of media sheets remaining in the stack by
27 multiplying the ratio by the final weight of the stack.

1 15. A method of estimating a quantity of media sheets remaining in a stack thereof,
2 the method comprising:

3 dispensing a first plurality of media sheets from the stack;

4 obtaining a first quantitative measurement of the stack before dispensing the first
5 plurality of media sheets;

6 obtaining a second quantitative measurement of the stack after dispensing the
7 first plurality of media sheets;

8 establishing a first delta measurement by subtracting the second quantitative
9 measurement from the first quantitative measurement;

10 establishing a first count by counting the media sheets that are dispensed from
11 the stack between the first quantitative measurement and the second quantitative
12 measurement;

13 establishing a first ratio by dividing the first count by the first delta measurement;

14 dispensing a second plurality of media sheets from the stack after obtaining the
15 second quantitative measurement;

16 obtaining a third quantitative measurement of the stack before dispensing the
17 second plurality of media sheets;

18 obtaining a fourth quantitative measurement of the stack after dispensing the
19 second plurality of media sheets;

20 establishing a second delta measurement by subtracting the fourth quantitative
21 measurement from the third quantitative measurement;

22 establishing a second count by counting the media sheets that are dispensed
23 between the third quantitative measurement and the fourth quantitative measurement;

24 establishing a second ratio by dividing the second count by the second delta
25 measurement;

26 calculating an average of the first ratio and the second ratio;

27 obtaining a fifth quantitative measurement of the stack; and,

28 establishing an estimated quantity of media sheets remaining in the stack by
29 multiplying the fifth quantitative measurement of the stack by the average of the first ratio
30 and the second ratio.

31
32 16. The method of claim 15, and further comprising:

33 providing a proposed print job; and,

34 determining whether the estimated quantity of media sheets remaining in the
35 stack is sufficient to complete the proposed print job.

1 17. The method of claim 13, and wherein the second quantitative measurement and
2 the third quantitative measurement are the same measurement.

3
4 18. A method of estimating a quantity of media sheets remaining in a given stack
5 thereof, the method comprising:

6 dispensing a plurality of media sheets from each of a plurality of stacks;

7 obtaining a pair of respective quantitative measurements of each stack;

8 establishing a respective count for each stack, wherein a given count is equal to
9 a respective number of media sheets dispensed between the associated pair of
10 quantitative measurements;

11 establishing a respective ratio for each stack, wherein a given ratio is equal to the
12 respective count divided by the difference between the respective pair of quantitative
13 measurements;

14 calculating a mean value of the ratios;

15 obtaining a target quantitative measurement from the given stack; and,

16 establishing an estimated quantity of media sheets remaining in the given stack
17 by multiplying the mean value by the target quantitative measurement.

18
19 19. The method of claim 18, and further comprising:

20 providing a proposed print job; and,

21 determining whether the estimated quantity of media sheets remaining in the
22 given stack is sufficient to complete the proposed print job.

1 20. A method of estimating a quantity of media sheets remaining in a given stack
2 thereof, the method comprising:

3 dispensing a plurality of media sheets from each of a plurality of stacks;

4 obtaining a pair of respective quantitative measurements of each stack;

5 establishing a respective count for each stack, wherein a given count is equal to
6 a respective number of sheets of media dispensed between the associated pair of
7 quantitative measurements;

8 establishing a respective ratio for each stack, wherein a given ratio is equal to the
9 respective count divided by the difference between the respective pair of quantitative
10 measurements;

11 calculating a median value of the ratios;

12 obtaining a target quantitative measurement from the given stack; and,

13 establishing an estimated quantity of media sheets remaining in the given stack
14 by multiplying the median value by the target quantitative measurement.

15
16 21. The method of claim 20, and further comprising:

17 providing a proposed print job; and,

18 determining whether the estimated quantity of media sheets remaining in the
19 given stack is sufficient to complete the proposed print job.
20

21 22. A media dispensing apparatus, comprising:

22 a media support device adapted to support a stack of media sheets thereon;

23 a picking device adapted to dispense individual media sheets from the stack in
24 succession;

25 a counting device adapted to detect count data indicative of how many media
26 sheets are dispensed from the stack during a given time period;

27 a measuring device adapted to detect measurement data indicative of a
28 quantitative characteristic of the stack;

29 a processor in data-communicative linkage with both the counting device and the
30 measuring device;

31 a computer readable memory device; and

32 a set of computer executable instructions operatively resident within the memory
33 device and executable by the processor, the set of computer executable instructions
34 adapted to cause the processor to compute an estimated number of media sheets
35 remaining in the stack based on the count data and the measurement data.

1 23: The apparatus of claim 22, and wherein the counting device is a top-of-form
2 sensor.

3
4 24. The apparatus of claim 22, and wherein the measuring device is adapted to
5 substantially detect a weight of the stack.

6
7 25. The apparatus of claim 22, and wherein the measuring device is adapted to
8 substantially detect a thickness of the stack.

9
10 26. The apparatus of claim 22, and wherein:
11 the stack has a top and an opposite bottom;
12 the picking device comprises a pick roller adapted to dispense individual media
13 sheets from the stack top, wherein such dispensing of media sheets depletes the stack;
14 the media support device comprises a lift mechanism adapted to lift the stack
15 bottom toward the pick roller as the stack is depleted; and,
16 the measuring device is adapted to substantially detect a position of the stack
17 bottom relative to the pick roller.

18
19 27. The apparatus of claim 22, and wherein the set of computer executable
20 instructions is further adapted to cause the processor to calculate a ratio of a given
21 change in the quantitative characteristic to a corresponding number of media sheets
22 dispensed from the stack.

23
24 28. The apparatus of claim 27, and wherein the set of computer executable
25 instructions is further adapted to cause the processor to compute the estimated number
26 of media sheets remaining in the stack based on the ratio and a measurement datum
27 indicative of the quantitative characteristic of the stack.

28
29 29. The apparatus of claim 27, and wherein the set of computer executable
30 instructions is further adapted to cause the processor to compute a plurality of ratios,
31 wherein each ratio is a ratio of a respective change in the quantitative characteristic to a
32 respective corresponding number of media sheets dispensed from the stack.

1 30. The apparatus of claim 29, and wherein the set of computer executable
2 instructions is further adapted to cause the processor to calculate a mean value for the
3 plurality of ratios.

4
5 31. The apparatus of claim 29, and wherein the set of computer executable
6 instructions is further adapted to cause the processor to calculate a median value for the
7 plurality of ratios.

8
9 32. A media dispensing apparatus, comprising:
10 a means for supporting a stack of media sheets;
11 a means for dispensing individual media sheets from the stack in succession;
12 a means for generating count data indicative of how many media sheets
13 dispensed from the stack during a given time period;
14 a means for generating measurement data indicative of a quantitative
15 characteristic of the stack; and,
16 a means for computing an estimated number of media sheets remaining in the
17 stack based on both the count data and the measurement data.